

OUR NEXT MEETING...

...is at **Elmhurst College**
Wednesday
January 18, 2012
Pizza: 5:30 p.m., Meeting: 6:30 p.m. – 9:00 p.m.

This will be the **28th Annual Tri-Physics Meeting**, hosted by **Earl Swallow** and colleagues, who will supply phood (at a modest cost), phun, and a phree giveaway.

<u>Future Meetings</u>			
Feb 4 - 8	(Sat-Wed)	AAPT-Winter Meeting	Ontario, CA
February 16	(Thu)	Lane Tech H S	Karlene Joseph
Feb 27- Mar 2	(Mon-Fri)	Aps March Meeting	Boston, MA
March 7	(Wed)	Loyola U.	Gordon Ramsey
March/April ??	(Sat)	CSAAPT, Thornton H S, Harvey	
Mar 29-Apr 1	(Thu-Sun)	NSTA National Meeting	Indianapolis
April ??	(Fri-Sat)	ISAAPT, U of I	Urbana-Champaign
April 10 or 17	(Tue)	Lake Forest College	Bailey Donnally/Mike Kash/Scott Schappe
May 7	(Mon)	Niles West H S	Martha Lietz
May ?	(Tue)	Physics Day @ Great America	Krystal Bern (or Nate Unterman) (kbern@sftp.com)
June 5 (tentative)	(Tue)	MSI (& annual Host Meeting)	Ruth Goehmann

AT OUR LAST MEETING,,,

...We were welcomed by **Eric Landahl**, who told us about a new program at **DePaul** that trains physics teachers: students get a B.S. in Physics and an M.A. in Education. The program is producing its first graduates this year. Contact Eric (elandahl@depaul.edu) for more information if you know of interested students.

Announcements: **Lane Tech** will be hosting its first ISPP meeting on February 16th. This new meeting location will be coordinated by new host, **Karlene Joseph**. Due to time constraints with CPS, we need to be out of the building by 8 pm, so our meeting time will be one hour earlier, starting at 5:30 pm.

The National AAPT meeting will be held February 4th-8th in Ontario, California. Look for Chicago members Martha Lietz, Tom Senior and Ann Brandon (and others) if you plan to go!

Art Schmidt (Northwestern) started out the meeting by sharing a few of his favorite holiday gift ideas a la Jim Szeszol, and taken from the Northwestern “toy room.” He had a climbing bear, suspended on two ropes, which climbs the ropes when they are pulled one then the other, alternately. He also had a toy helicopter, and exhorted us to use it to teach our students vectors. The “mystery stick”, or a “geegaw” which turns either clockwise or counterclockwise, depending on how the supporting stick is rubbed. He also had a Bernoulli effect cart, a gyroscope, a hovercraft and a clown on a bicycle which balances on a tight wire. Thanks, Art, for inspiring our holiday shopping!



Pete Insley (Columbia College) had a classroom set of diffraction gratings on index cards, made from a few of the “rainbow glasses” sold at Educational Innovations. He used them to show us the spectra emitted by several “Color Flame Candles” from Educational Innovations. The candles are available for \$2.95 for 12 candles from

<http://www.teachersource.com/LightAndColor/Spectra/ColorFlameBirthdayCandles.aspx>

Using the diffraction gratings, the several strong emission lines could be seen for each of the different colored flames. Thanks for a beautiful show, Pete!

Jeremiah Campion (VOISE Academy - CPS) demonstrated a website he found at <http://physicspuzzle.com/online-skill-games/>. He demonstrated several skill games he uses with his students, including one called “Sugar, Sugar” where the students draw ramps to guide falling sugar into various “buckets.” The students can make a connection between the steepness of the ramps and the speed at which the sugar falls. He also demonstrated “Trajectory”, a game in which students aim a launcher and project a ball into various configurations of blocks. He asks his students to analyze the motion of the ball in both the horizontal and vertical directions. He has written a lab for the “Trajectory” game, and is working on writing a lab for his students to use with “Angry Birds.” Thanks, Jeremiah.



Tom Senior (Lake Forest College) presented some anaglyphs which use color to make 3-D images. In this case, we used glasses with one red filter and one cyan filter to view various images Tom projected on the screen. He had created several images with smiling faces, separated by different distances. The different images were seen to different depths depending on the distance between the two different color images on the original. He also informed us that more images are available on line.

Tom also showed us a video of giant Chladni plates with colored sand

http://www.youtube.com/watch?v=Oz53w_k_j_A. The instructor rubs the edge of the large circular plate and the sand, originally in four different color piles. Both color mixing and standing waves can be demonstrated with this video. As the sand colors mix, there is a demonstration of the pointillism method of color mixing. And since the sand tends to accumulate at the nodal lines of the plate, students get a picture of the 2-D standing waves excited on the plate as the instructor in the video rubs the edge of the plate. Thanks, Tom, for two very colorful demos.

Ann Brandon (Joliet West, retired) followed up on a demonstration done by Andy Morrison at the Joliet meeting last month. The demonstration involved showing how to find the center of mass of a meter stick by balancing it on one finger of each hand and slowly moving your fingers toward the middle. The demonstration was done at Joliet with different materials wrapped around each finger to demonstrate that it is not necessary to have the same coefficient of friction between the two points of support. The demonstration was also done with various masses hanging from one end to change the location of the center of mass of the system. Ann then followed up with an addition to this demonstration inspired by a visit to Earl Zwicker in Wisconsin. Earl had a picture with Ed McNeil in it, doing this same demonstration but with a helium balloon attached to one end of the meter stick, acting effectively as a “negative mass”. Ann posed the question: what will happen to the “center of mass” of the system. In fact, the balance point for the meter stick/balloon system moved away from the end with the balloon attached. Very uplifting addition to last month’s demo, Ann!



Martha Lietz (Niles West High School) reminded us of some demonstrations done by Susan Fischer (DePaul) several years ago with large binder clips and rulers. The goal of those demonstrations is to give the students a feel for how the moment of inertia of an object changes as the mass moves further from the axis of rotation. This then explains why it is easier to balance a meter stick vertically on one finger, than it is to balance a shorter object such as a pencil. Martha then showed a video of the Cirque du Soleil ladder act from the “Corteo” show, and pointed out how it is easier for the performer to balance when he is at the top of the ladder, as the moment of inertia of the system is greater when he is farther from the pivot point which is at the floor. The video can be found at <http://www.youtube.com/watch?v=IHGVp0Ff-68>. The video provides an interesting “real life” application of this phenomenon which helps the students appreciate it more.

Roy Coleman (Morgan Park High School, retired) showed us a simple demonstration he uses to remind his students to consider the initial conditions of motion. He holds up a book and a piece of paper and asks the students to vote as to which one will hit the table first when he releases them. The students then vote (most choosing the book), and when the votes are tallied he then performs the demonstration...but not before he crumples the paper into a small ball. Of course, both strike the table at nearly the same time. He then reminds the students to consider the initial conditions before starting a problem! Very thought provoking, Roy! Thanks.

Eric Landahl (DePaul University) then closed the meeting by handing out the giveaway, which was a kit inspired by a video at http://www.youtube.com/watch?v=i_1kA5xUg2I created by Dr. Jonathan Hare in the UK. This video shows a simple demonstration of the amplifying power of the transistor, without which much of modern-day electronics would not be possible. The give-away consisted of the materials required to make the demonstration which Dr. Hare shows in his video. First, Dr. Hare showed how a 9 V battery and resistor are used to light an LED. He also shows how the LED does NOT light if the free ends of the circuit are held between ones fingers. There is a minute current that goes through the fingers, but it is not enough to light the LED. The transistor is then used, and the small current through the fingers is provided to the base of the transistor, and a larger amplified current passes through the collector/emitter and lights the LED. The instructions for this demonstration can be found at <http://www.creative-science.org.uk/transistor.html> and many other interesting demonstrations can be found at Dr. Hare’s site www.creative-science.org.uk. Eric then showed us how he used this device to make the static electricity detector which greeted us at the door on entry to the meeting. Using the two transistors provided in the giveaway kit, a Darlington transistor pair was created to gain of roughly 10,000. A chain of teachers holding hands provided the base current and the Darlington pair created enough amplification of that small signal to light the LEDs on a small flashlight. Eric then showed how this can be used (with one end grounded) as an electrostatic charge detector. He shuffled his feet on the floor and then discharged through the base of one transistor in the Darlington pair, and the small current provided was amplified enough to light the LEDs in the flashlight. Thanks for the great giveaway, Eric (and everyone else at DePaul as well)!

Thanks everyone for a great meeting and see you in Elmhurst! The Jensen Award winner will be announced.

Respectfully submitted by Martha Lietz.

